FARM AND HOME SCIENCE IN 1930

A radio talk by W. H. Evans, Office of Experiment Stations, delivered through WRC and 39 other radio stations associated with the National Broadcasting Company, December 13, 1930.

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Although agriculture is the oldest industry of man, it is only within the last one hundred years that special institutions have been established for the study of agricultural problems. In this country the first agricultural experiment station celebrated its fiftieth anniversary about five years ago. To-day there are agricultural experiment stations in every State and in Alaska, Hawaii, Porto Rico, Guam, and the Virgin Islands.

This national system is the most extensive and generously supported system of research in agriculture of any country and the results that have been achieved touch the lives of more people than does any other research undertaking.

The national system of agricultural experiment stations as it exists in this country had its beginning with the passage by Congress of the Hatch Act, which became a law on March 2, 1887, with an annual appropriation by the Federal government of $15,000 to each State. By subsequent legislation the Federal contribution toward the support of these State institutions has been increased gradually until now it amounts to $90,000 for each State. The appropriation is the same for each State, regardless of its size or the prominence of its agriculture. The reason for this is the benefits of agricultural research are not limited by State boundaries and, as is often the case, the results of discoveries at one station may be of equal importance in another region 2,000 miles away.

The generous Federal support to the experiment stations which amounts to $90,000 annually to each State, is met by State contributions nearly in the proportion of three dollars for every dollar given by the Government. For the fiscal year ended June 30, 1930, the total incomes of the stations amounted to about $17,200,000, of which sum $4,320,000 came from the Federal Government and $12,880,000 from sources within the States. The entire annual cost of the stations represents an expenditure of about 15 cents per capita of the population of the country.

A report of a recent survey of the agricultural experiment stations indicates that the economic value of the results of the research of 35 stations to the agricultural industry of the country in 1928 was in excess of $840,000,000. If the proportion was maintained by the 15 nonreporting institutions, the total contribution of the stations to the industry they represent was well beyond a billion dollars, or about $100 for every dollar expended in their maintenance.

The stations have over 3,000 specialists in various branches of agricultural science and practice who are engaged on more than 7,000 investigations of agricultural problems. The results of the research are made available through the publications of the stations and through the Agricultural Extension Service which is organized in every State.

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The investigations carried on at the experiment stations cover the entire field of agriculture and they embrace studies of the production of crops and livestock, the improvement and better adaptation of crops, means of maintaining soil fertility, and supplying the needs for increasing crop production. They center on controlling losses from insects and plant diseases and they deal with the manufacture and handling of the products of the dairy, orchard, and field, as well as the utilization of wastes from various farm operations. Recently the economics of agriculture has been given attention and production costs, marketing, and distribution are being studied seriously. Another recent development at the experiment stations is research in home economics, in which home management, nutrition, clothing, and means for lightening labor in the home are being investigated.

In this latter field the work of the stations is brought in vital relation with the lives of all the people, because of questions pertaining to proper nutrition, the handling of food, and physiological requirements of the human body. These are receiving attention as never before. It can no longer be said that "research in agriculture concerns itself with the health and welfare of the pig but neglects the child."

The stations were among the early discoverers of the necessity of the supplemental factors in feeds, that are now known as vitamins, and their importance. They have been especially active in determining the place of vitamins in the diet. This work, which originally had to do with the feeding of animals, has had a wide application to the feeding of the human family, particularly of children. Similarly, the mineral requirements for proper nutrition and the effect of deficiencies in relation to development have been widely studied. The superiority of yellow corn over white corn in promoting growth was a station discovery, and it has found application in animal feeding and human nutrition. The discovery by a station man that vitamin D could be imparted to deficient foods, or greatly increased in others, by irradiating them with ultra-violet light led to the commercial application of the process. The discovery at a western station that there was a marked variation in the degree of hardness of curd of cows' milk, irrespective of fat content, and that soft curd milk was much more easily digested by infants and invalids has led to its use in several hospitals. The use by certain of the northwestern stations of iodine as a preventive of goiter and hairlessness in domestic animals contributed to the knowledge of the prevention of goiter in human beings. Other work with food products has had an important part in protecting them from spoilage and assuring their healthfulness.

The safeguarding of the health of children and knowledge of their proper nutrition are among the products of station work which are of universal benefit. Studies of the diet of pupils in a rural school led to similar investigation in many States and aroused interest in the nutrition and physical condition of school children. An adequate school lunch is now considered of vital importance for the growing child. The stations are also studying the dietary of the home, and they have been able in many instances to show how it could be improved at no appreciable increase in cost.

The plant breeders have produced varieties of crops that are more productive, of better quality, and more resistant to insect pests and plant diseases than formerly. A variety of hard wheat developed at one of the stations from a selection of a single head is now planted on millions of acres. A smut resistant variety of wheat developed at a northwestern station is the most commonly grown variety in that grain-producing area. About 90 per cent of the barley grown in one State is a variety developed by the experiment station of that State. In another State fully 60 per cent of the oats produced are of a station variety.

In horticulture, orchard practices have been revolutionized as a result of station research. The use of cover crops to increase organic matter in soils is taking the place of clean cultivation and dust mulch as means for retaining soils moisture. Potatoes do not sprout immediately after they are harvested, but several stations have found means for inducing early sprouting that make it possible to grow two crops during a season, using the early crop for planting purposes for the late or main crop. By following the principles of plant breeding and introductions from other regions, many new and improved varieties of fruits and vegetables are available to growers.

Much attention is given to studies of soils and means for retaining their fertility, and distinct advancement has been made in knowledge of the relation of soils to crops, changes in soils brought about by bacterial action, effect of erosion on soil fertility, influence of burning over land on the destruction of organic matter, and on the economical use of manures and fertilizers.

In animal husbandry the station investigations cover the entire range of breeding, feeding, and care of all kinds of livestock and the utilization of livestock products. The entire theory and practice of animal feeding has been profoundly influenced by investigations in which the stations have taken a leading part.

Dairying has become an important farm industry as a result of station investigations, dealing with the breeding and care of dairy animals, the handling of milk, and the manufacture of dairy products. The industry was given a great impetus by the perfection and general use of the Babcock test, devised by Dr. S. M. Babcock of the Wisconsin station. This machine makes possible the rapid determinatio of the fat in milk, enables the dairyman to cull out unprofitable cows, secures a better product, and assures the producer a just price for his milk. It has been stated that on the Babcock test and the cream separator the modern dairy industry is founded.

The station entomologists and plant pathologists have been active in solving life history problems of various pests and finding means for their control. Within the last few days an eastern station reported that through the breeding and liberation of parasites of the Oriental fruit moth, peach growers in the State were saved a loss of at least $100,000 on the crop of 1930.

Similar work with other insects has been successfully carried on by different stations with as striking results. Through a better understanding of various plant diseases the stations are in a position to give authoritative advice on the control of many destructive diseases.

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The investigations of the station veterinarians have made it possible to protect the farmers' stock from many diseases. Veterinarians at nearly half of the stations have been investigating the abortion disease of cattle, goats, and swine, and they have contributed much to the advancement of knowledge of means for its control and even its eradication. This is of great importance due to the recently discovered fact that the milk of infected animals may carry the causative organism of a disease of man known as undulant fever, which is often mistaken for typhoid fever.

One of the newer fields of station investigation is that of agricultural economics. It includes the old farm management studies that were intended to so distribute farm activities as to produce the largest labor income, but it goes beyond the farm and studies the distribution of products, methods of marketing, marketing organizations, etc. Studies of quality of product as a factor of marketability are receiving attention at many stations. Several stations have taken up studies of taxation in an effort to arrive at a proper balance of rural and urban taxes.

Time limitations prevent mention of the stations' work in agricultural engineering, rural sociology, textiles and clothing, and in other fields. Important contributions have been made in all of them. The stations are in close contact with local problems, and if you have any question of the nature that has been outlined take it up with the experiment station in your State. The stations are for your service, and they will aid you to their utmost ability.
